

U.S. Serial No.: 10/822,247

Hunziker, H.

Response to Office Action mailed March 21, 2005

REMARKS

Claims 30-34 have been canceled, and thereby withdrawn from further consideration in the present application.

The Office Action objects to claims 20 and 35 due to the specified informalities. Applicant has corrected the informalities per the examiner's helpful suggestions.

The Office Action rejects claims 1-29 under 35 U.S.C. 103 as being unpatentable over Kusuda et al. in view of Martin et. al.

Applicant has amended claim 1 to more clearly distinguish over the prior art references. Claim 1, as amended, recites an assembly for supplying electric power to a printed circuit board. A main body having a plurality of terminal mounting portions is disposed on an upper surface of the main body. A plurality of terminals is coupled to the plurality of terminal mounting portions. Each of the plurality of terminals includes a substantially flat surface for securing wire hardware and a shaft extending through a slot in the main body to a bottom surface of the main body. A first side flange having a barbed-edge is coupled to a first side surface of the main body. A second side flange having a barbed-edge is coupled to a second side surface of the main body. The first and second side flanges are operable to allow the main body to readily disengage from the printed circuit board while giving the assembly a footprint on the printed circuit board of substantially the size of the main body.

Applicant believes that neither Kusuda nor Martin, taken singularly or in combination, teach or suggest an assembly having first and second side flanges which are operable to allow the main body to readily disengage from a printed circuit board.

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Moreover, Applicant believes that neither Kusuda nor Martin, taken singularly or in combination, teach or suggest that the first and second side flanges of the instant application function to readily disengage the printed circuit board while giving the assembly a footprint on the printed circuit board of substantially the size of the main body.

Kusuda teaches a plurality of terminals which have pins extending through the main body for mounting to a board. Kusuda also teaches a plurality of terminals which include substantially flat surfaces for securing wire hardware. Kusuda, however, does not teach an assembly which includes first and second side flanges. Kusuda does not teach that the first and second side flanges have a barbed-edge and are coupled to a first side surface of the main body. Kusuda does not teach that the first and second side flanges are operable to allow the main body to quickly disengage a printed circuit board. In addition, Kusuda does not teach an assembly where the first and second side flanges quickly disengage a printed circuit board while maintaining a footprint on the printed circuit board of substantially the size of the main body. A reduction or maintenance of a footprint of the "power supply terminal assembly" on a printed circuit board, or otherwise, is not an object of the Kusuda invention. Moreover, the manufacturing and operating convenience of providing side flanges to allow the main body to readily disengage a printed circuit board is not taught nor suggested by Kusuda.

Martin teaches an electrical connector with a dielectric housing having a pair of "accessory mounting stations" integrally formed with the housing on respective opposite sides of the housing. However, the electrical connector taught by

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Martin is intended for insertion into a cutout of a mounting plate or into a part of another housing piece. The insertion of the electrical connector into a printed circuit board or other board is neither taught nor suggested by Martin. Martin does not teach a plurality of terminals, each of which include a substantially flat surface for securing wire hardware. Martin does not teach a shaft extending through a slot in the main body to a bottom surface of the main body. Finally, Martin neither teaches nor suggests an assembly as claimed in the instant application where the first and second side flanges allow the assembly to quickly disengage a printed circuit board (PCB) and render a footprint on the PCB which is substantially the same size as the main body. As with Kusuda, Martin is not concerned with the size of the footprint rendered by the housing of the electrical connector when attached to a mounting surface or otherwise. The intention of reducing or maintaining a footprint that is substantially the same size as the connector housing is neither taught nor suggested. The central object of the Martin reference is to provide accessory attachment points to provide "strain relief".

Assemblies such as that suggested by Kusuda are soldered in place or attached with screws or nuts and bolts. If the assembly taught by Kusuda is soldered in place, it may be difficult to remove should the assembly, the printed circuit board or other board component fail. Moreover, there is extra manufacturing time and cost involved with soldering and desoldering the assembly from the board.

In contrast, the present application teaches an assembly which is designed to mount without solder to a PCB. The assembly includes first and second side flanges which can be

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designed to allow the main body to be easily removable from a printed circuit board and which leave a footprint of substantially the same size as that of the main body on the printed circuit board. When the instant assembly is fully installed in a mounting surface of a power supply, the assembly as a whole has substantially the same footprint as the main body. The assembly does not require additional space for any wing or anchor to screw or bolt the connector in place, as found in the prior art. Instead, the side flanges securely hold the assembly to a mounting surface, with a footprint substantially the size of the main body. Moreover, the assembly does not require manufacturing steps of screwing the assembly to the power supply, and unscrewing the assembly for maintenance or servicing. The instant assembly simply snaps into place by hand or machine insertion with minimal effort. No special tools are needed. The side flanges hold the assembly securely to a mounting surface over time and in high vibration environments, thereby reducing failures and maintenance. The assembly is removed by compressing the sides of the flanges to retract ridges from under a mounting surface. This snap-in-place feature may reduce manufacturing defects and operator error as compared to screw-in-place type assemblies.

Again, Applicant believes that neither Martin nor Kusuda, taken singularly or in combination, teach or suggest every limitation of the instant claims of the present application, primarily due to the fact that neither Kusuda nor Martin teaches nor suggests an assembly which is designed to mount to a printed circuit board having first and second side flanges which allow the main body to readily disengage the printed circuit board and

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which insert into the PCB to render a footprint of substantially the same size as that of the main body.

In addition, and in light of the foregoing, Applicant respectfully suggests that there is a demonstrable lack of motivation to combine the Kusuda reference with the Martin reference. The Federal Circuit has spoken repeatedly concerning the requirement of a motivation to combine references:

"There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art." *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a *prima facie* case of obviousness was held improper.).

The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art.

"The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Lee*, 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002) (discussing the importance of relying on objective evidence and making specific factual findings with respect to the motivation to combine references); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596

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(Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In *Ruiz v. A.B. Chance Co.*, 357 F.3d 1270, 69 USPQ2d 1686 (Fed. Cir. 2004), the patent claimed underpinning a slumping building foundation using a screw anchor attached to the foundation by a metal bracket. One prior art reference taught a screw anchor with a concrete bracket, and a second prior art reference disclosed a pier anchor with a metal bracket. The court found motivation to combine the references to arrive at the claimed invention in the "nature of the problem to be solved" because each reference was directed "to precisely the same problem of underpinning slumping foundations." *Id.* at 1276, 69 USPQ2d at 1690.

In the instant application, however, the Kusuda reference and the Martin reference are not directed to "precisely the same problem". *Id.* The Kusuda reference teaches a power supply terminal assembly that is directed to a power supply terminal assembly for use on a back wiring board (BWB) of a communication device. The Martin reference is directed to "an electrical connector which is adapted to have an accessory such as a strain relief attached thereto" (see column 1, lines 5-7). Both the Kusuda reference and the instant application direct their attention to the specific problem of supplying electric power to a board. The Martin reference is specifically directed to the "need for an electrical connector which improves the mounting of a strain relief or other accessory on the connector" (see column 1, lines 33-35).

An analogous situation was presented in *Jones*, supra. In *In re Jones*, the claimed invention was the 2-(2 ϕ -aminoethoxy) ethanol salt of dicamba, a compound with herbicidal activity.

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The primary reference disclosed *inter alia* the substituted ammonium salts of dicamba as herbicides, however the reference did not specifically teach the claimed salt. Secondary references teaching the amine portion of the salt were directed to shampoo additives and a byproduct of the production of morpholine. The court found there was no suggestion to combine these references to arrive at the claimed invention.

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. In *re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990) (Claims were directed to an apparatus for producing an aerated cementitious composition by drawing air into the cementitious composition by driving the output pump at a capacity greater than the feed rate. The prior art reference taught that the feed means can be run at a variable speed, however the court found that this does not require that the output pump be run at the claimed speed so that air is drawn into the mixing chamber and is entrained in the ingredients during operation. Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." 916 F.2d at 682, 16 USPQ2d at 1432.). See also *In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992) (flexible landscape edging device which is conformable to a ground surface of varying slope not suggested by combination of prior art references).

Likewise, in the instant application, the fact that the Martin reference may be combined with the Kusuda reference or modified does not render the combination obvious unless either Martin or/and Kusuda suggest the desirability of the combination.

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Applicant respectfully submits there is no such suggestion in either reference.

A statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). See also *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1318 (Fed. Cir. 2000) (Court reversed obviousness rejection involving technologically simple concept because there was no finding as to the principle or specific understanding within the knowledge of a skilled artisan that would have motivated the skilled artisan to make the claimed invention); *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999) (the level of skill in the art cannot be relied upon to provide the suggestion to combine references).

In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. A proposed modification cannot render the prior art unsatisfactory for its intended purpose or change the principle of operation of a reference. Although the Martin reference teaches the use a "latch arm" to secure the connector to a mounting plate, the reference also teaches a pair of "accessory mounting stations" (26 in FIG. 1) located on respective opposite sides of the connector housing. These accessory mounting stations, were they

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incorporated into the present application, would render the claimed assembly unsatisfactory for its intended purpose. The present assembly would not be operable to plug into a PCB or other electrical board with the addition of the mounting stations. The intention of the Martin reference to provide mounting stations for "strain relief" would be significantly changed.

In addition to a lack of motivation to combine the Kusuda and Martin references, Applicant respectfully submits that certain secondary considerations overcome the 103 obviousness rejection. The present invention serves to fulfill a long-felt need by industry. Space on printed circuit boards is increasingly at a premium. Manufacturers are continually trying to add circuits and circuit components to the same surface area of a board. Again, in the prior art, assemblies such as that suggested by Kusuda are soldered in place or attached with screws or nuts and bolts. If the assembly taught by Kusuda is soldered in place, it may be difficult to remove should the assembly, the printed circuit board or other board component fail. Moreover, there is extra manufacturing time and cost involved with soldering and de-soldering the assembly from the board.

If a prior art assembly such as that suggested by Kusuda is attached to the chassis or PCB with screws or nuts and bolts, then the assembly is generally configured with side wings or anchors to provide a surface to secure the connector. The anchors are typically located on either side of the main body of the assembly. The screw is run through an opening in the anchor to hold the assembly in place on the chassis or PCB. The anchors of the assembly take up additional space, in excess of

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the footprint of the main body of the assembly, on the chassis or PCB mounting surface. The additional space needed for an anchor-configured assembly reduces space available on the chassis or PCB for other components. Moreover, the anchors of the assembly are a weaker portion of the assembly and may break under stress. There is manufacturing time required to screw the assembly in place, and the assembly may loosen over time in high vibration environments, or if not properly tightened during installation. A screw-mounted assembly also imposes maintenance issues when it needs to be replaced.

An assembly suggested by the literal combination of Martin with Kusuda would not alleviate the problem. The accessory mounting stations taught by Martin would impede the insertion of the assembly into a PCB. Moreover, the footprint of such an assembly would be rendered substantially larger than that of the housing.

Again, and in contrast, when the instant assembly is fully installed in a mounting surface of a power supply, the assembly as a whole has substantially the same footprint as the main body. The assembly does not require additional space for any wing or anchor to screw or bolt the connector in place, as found in the prior art. Instead, the side flanges securely hold the assembly to a mounting surface, with a footprint substantially the size of the main body. Moreover, the assembly does not require manufacturing steps of screwing the assembly to the power supply, and unscrewing the assembly for maintenance or servicing. The instant assembly simply snaps into place by hand or machine insertion with minimal effort. No special tools are needed. The side flanges hold the assembly securely to a mounting surface over time and in high vibration environments,

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thereby reducing failures and maintenance. The assembly is removed by compressing the sides of the flanges to retract ridges from under a mounting surface. This snap-in-place feature may reduce manufacturing defects and operator error as compared to screw-in-place type assemblies.

The present invention has also enjoyed a measurable and demonstrable amount of commercial success since its introduction. The present invention is utilized in a high-volume power supply model of one of the largest manufacturers of dc-dc and ac-dc power conversion products in the world.

In light of the foregoing, claim 1 as amended is believed to patentably distinguish over the prior art references, taken singularly or in combination.

Applicant has amended claims 2-13 to include the limitations of the base claim. Claims 2-13 are believed to be in condition for allowance as each is dependent from an allowable base claim.

Applicant has amended claim 14 to more clearly distinguish over the prior art references. Claim 14, as amended, recites an assembly for supplying electric power to a printed circuit board. A main body having a terminal mounting portion is disposed on a first surface of the main body. A terminal is coupled to the terminal mounting portion. The terminal includes a substantially flat surface for securing wire hardware and a shaft extending through a slot in the main body to a bottom surface of the main body. A first flange having a ridge portion is coupled to a second surface of the main body. The first flange is operable to allow the main body to readily disengage from the printed circuit board while giving the assembly a footprint on the printed circuit board of substantially the size of the main body.

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Applicant believes that neither Kusuda nor Martin, taken singularly or in combination, teaches or suggests all the limitations of the foregoing assembly as presently claimed. Again, neither Martin nor Kusuda teaches nor suggests an assembly which mounts to a printed circuit board to render a footprint of substantially the same size as that of the main body or housing. Again, neither Martin nor Kusuda teaches nor suggests an assembly which includes a flange having a ridge portion that is operable to allow the main body to readily disengage from the printed circuit board.

For this reason and those reasons previously identified (e.g., lack of motivation and secondary considerations), claim 14 as amended is believed to patentably distinguish over the prior art references, taken singularly or in combination. Claims 15-24 are believed to be in condition for allowance as each depends from an allowable base claim.

Applicant has amended claim 25 to more clearly distinguish over the prior art references. Claim 25, as amended, recites an assembly, mounted on a printed circuit board, for connecting to electrical conductors. A non-conductive body having a terminal mounting portion is disposed on a first surface of the body. A terminal is coupled to the terminal mounting portion. The terminal includes a substantially flat surface for securing wire hardware and a shaft extending through a slot in the body to a bottom surface of the body. A first clip is coupled to a second surface of the body. The first clip is compressible for mounting on the printed circuit board while giving the assembly a footprint on the printed circuit board of substantially the size of the body.

Applicant believes that neither Kusuda nor Martin, taken

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singularly or in combination, teach or suggest a first clip coupled to a second surface of a non-conductive body which is compressible for mounting on the printed circuit board while giving the assembly a footprint on the printed circuit board of substantially the size of the body.

For this reason and those reasons previously identified (again, e.g., lack of motivation and secondary considerations) claim 25 as amended is believed to distinguish over the prior art references, taken singularly or in combination. Claims 26-29 are believed to be in condition for allowance as each depends from an allowable base claim.

The Office Action rejects claims 35 and 36 under 35 U.S.C. 103(a) as being unpatentable over Hutchins et al. in view of Martin et al.

Applicant has amended claim 35 to more clearly distinguish over the prior art references. Claim 35, as amended, recites a power converter circuit mounted to a printed circuit board. An electrical connector is coupled to the power converter circuit. The electrical connector includes a main body having a terminal mounting portion disposed on a first surface of the main body. The connector also includes a terminal coupled to the terminal mounting portion. The terminal includes a substantially flat surface for securing wire hardware and a shaft extending through a slot in the main body to a bottom surface of the main body. A first flange having a ridge portion is coupled to a second surface of the main body. The first flange is operable to allow the main body to readily disengage from the printed circuit board while giving the assembly a footprint on the printed circuit board of substantially the size of the main body.

Applicant respectfully suggests that neither Hutchins nor

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Martin, taken singularly or in combination, teaches nor suggests all the limitations of the power converter circuit as presently claimed. Hutchins teaches an "AC connector module" having a main body, a terminal mounting portion disposed on a surface of the main body and a terminal coupled to the terminal mounting portion. Hutchins does not teach or suggest a terminal shaft which extends through slots in the main body to a bottom surface of the main body. Instead, Hutchins teaches a "contact block" (see 66 in FIG. 5) having preferably three female contacts (see 82 in FIG. 5) for an external electrical plug to be inserted. In contrast, the present application teaches shafts which extend through the main body to a bottom surface of the main body where the shafts electrically contact a printed circuit board or other board.

Applicant believes that the Hutchins reference, taken literally and as a whole in combination with the Martin reference, do not teach all the limitations as set forth in amended claim 35. Because neither Hutchins nor Martin teaches or suggests the use of shafts which extend through the main body to a bottom surface of the main body which electrically contact a board, amended claim 35 is believed to overcome the prior art references, taken singularly or in combination. In addition, for the reasons cited above (e.g., lack of motivation and secondary considerations), Applicant believes the obviousness rejection is overcome. Claim 36 is believed to be in condition for allowance as it is dependent from an allowable base claim.

Applicant believes that all information and requirements for the application have been provided to the USPTO. If there are matters that can be discussed by telephone to further the

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prosecution of the Application, Applicants invite the Examiner to call the undersigned attorney at the Examiner's convenience.

The Commissioner is hereby authorized to charge any fees due with this Response to U.S. PTO Account No. 17-0055.

Respectfully submitted,
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